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EDUCATION READING ROOM IN THIS ISSUE:

- An Evaluation of Doctoral Dissertations
- The Local Research Program and the Research of Practitioners
- Physical Maturing as Related to Social Behavior
- Learning by Medical Students
- Editorial: Framework for Educational Research

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THE EDITORS SAY:—

The Framework for Educational Research

At the present time, whether we like it or not, most of the research being done in education consists of individual studies, largely autonomous, difficult to synthesize. Any one study may be a sparkling gem, but there is a marked absence of comprehensive designs for organization of the many contributions. The research is largely supported by the resources of motivated individuals, who do their studies at personal sacrifice. As a result, the total field of problems tends to be covered in a manner that is apparently democratic, free, and inefficient.

It is interesting to consider what might be done. It has been suggested at various times that specific types of changes should be made. Some suggest that the individual institution should specialize, so as to produce research on particular problems, in an organized pattern. Others feel that the key to progress lies in the promotion of large projects, financed adequately by foundations, directed by a leader who coordinates the work of a staff of specialists. Others, who seem to feel that research is always ultimately done by those persons who have a special type of personality, favor continuation of a free program, suggesting that penetration can best be achieved through persistence by individuals in lines of research dictated by their personal interests.

Perhaps some of the more general problems will be clarified if more persons support research by their own participation and by other types of contributions. In spite of current criticism, research in education is likely to continue for a long time to be characterized by a heavy emphasis upon fact-finding, the initial exploration of many little problems in a descriptive manner, replication of studies by accident rather than by design, and, finally, the production of research reports by a very small minority of workers in education. Is this what is wanted by the persons most concerned? H.D.C.

An Evaluation of Doctoral Dissertations in Educational Administration in California

HOWARD S. BRETSCH

The study included an analysis and an evaluation of 104 doctoral dissertations in Educational Administration which had been accepted by four major universities in California between 1940 and 1952.

The development of criteria for selecting and evaluating the dissertations constituted the first major step in the study. The second major step consisted of reviewing each dissertation and applying the criteria to it.

Selection of the Dissertations

The four areas from which dissertations were selected were: Educational Finance, School District Organization, School Housing, and Staff Personnel. The dissertations had been accepted by Stanford University, University of California at Berkeley and Los Angeles, and the University of Southern California. Six criteria were developed for selecting dissertations, the most significant of which were concerned with the relationships of the studies to the content and functions of Educational Administration. Certain dissertations in other disciplines bore important relationship to the field of Educational Administration but were omitted from this study.

Criteria for Evaluating Dissertations

Unlike most of the criteria found in the literature those employed in this study emphasized the relative importance of the various parts of the dissertation and were not developed as a check list which assumed coordinate value for each item. The full statement of the criteria constituted several pages. Essentially, however, each dissertation was evaluated on the basis of (1) the significance of the dissertation, (2) the appropriateness and excellence of the procedures, and (3) the strength of the presentation.

Howard S. Bretsch was a member of the faculty of the University of California at Berkeley until last summer. He then went to the University of Michigan as Professor of Educational Administration. He has also been on the faculty of the University of New Hampshire and the summer faculty of Pennsylvania State University. His public school experience involved work as a teacher and administrator in New York. The work on which this article is based was done at Berkeley in 1952-1955. The work was supported by research funds from the University of California.

Of these three, the significance of the dissertation was regarded as primary. The criteria of significance emphasized creativity, originality, the establishing of relationships, and the importance of the final contribution. Throughout the evaluation, stress was placed on the quality of thinking that had gone into producing the research and the explicitness of the author. The criteria of significance were stated as questions. However, in order to be classified as significant, the dissertation had to fulfill one or more of the criteria in the affirmative. Stated briefly the criteria of significance were:

1. Did the study establish new truths or add new knowledge to the field?
2. Did the researcher develop a new technique?
3. Did the researcher develop an original and valid instrument for identifying and measuring significant phenomena?
4. Did the researcher, through a synthesis of factors heretofore isolated introduce a new field of study?
5. Did the researcher develop valid criteria for judging theory or practice?
6. Did the researcher provide insight into solving practical problems effectively?

The emphasis on newness or originality was regarded as defensible since the creativity and sound imagination that produce an original work very frequently demonstrate, in themselves, a high level of achievement. This emphasis on originality did not exclude the possibility that a student might have produced a very significant piece of work by digging more deeply into an old problem or attempting to verify earlier studies on a given subject.

The procedures of the dissertation were evaluated by giving special attention to (1) the design for the study, (2) the selection of the subject, (3) the validity of the assumptions, (4) the use of related materials, (5) the techniques for the collection and treatment of the data, (6) the insightfulness of the writer in interpreting the data, and (7) the extent to which the judgments and the conclusions were supported by the evidence. The presentation was evaluated largely on the organization, the data, and the format of the dissertation.

The findings of the study were of two types: (1) An evaluation of each dissertation based on an application of the criteria, (2) A group analysis of the dissertations for each of the four areas. Neither the evaluations of each dissertation nor the group analysis can be given in this brief report. However, the observations and implications which follow indicate the dominant importance of evaluation to the study and provide insight into the nature of it.

Findings of This Study

1. The significance of most of the dissertations lay in helping to solve practical problems. Many of them were limited in general significance since they dealt primarily with practical problems of a given locale.
2. In general, the studies did not deal with the broader social implications for education, nor did they, except rarely, add important new knowledge to the field.
3. There appeared to be a trend in some institutions for doctoral candidates to engage in studies in which they were admittedly pioneering new fields or making new approaches to established ones. Many of the studies of this type demonstrated a high quality of thinking both in the development of the problem and in the pursuit of it.
4. Limitations upon the researchers seemed to have raised an unsolved dilemma. In some cases the researcher chose a highly significant problem, the importance of which he was not fully aware. As a result, he did not employ the necessary skills for pursuing it nor engage in a very penetrating interpretation of the findings. In other cases the researcher chose a less important problem and because of its simplicity completed it very satisfactorily. The decision to select a problem of outstanding importance rather than one of less significance is not always easy to make. However, the extent to which the capability of the candidate can be matched with the difficulty of the problem seems important to the quality of the research produced.
5. Most of the studies did not test hypotheses.
6. With few exceptions, the studies were of the descriptive type. Of these, it would seem that too many of the normative studies did not attempt to test the reliability of the data.
7. Experimental variation as a method of research was not employed to any great degree by researchers in educational administration. Admittedly the problem of studying human behavior experimentally is difficult. However, in the opinion of the writer, this difficulty does not exonerate researchers from two things: First, attempting to use experimental variation, wherever appropriate, as it has been known traditionally as a research method; and second, finding newer and multiple ways for conducting experimental studies.
8. Nearly all of the researchers employed a variety of techniques for the collection and the treatment of data. In general this was sound, especially so if they were used to establish the validity and reliability of data. However, some researchers seemed to have thought that the use of a variety of techniques for collecting a large bulk of data compensated for

not having selected an important study. In this manner, the multiple approach merely provided more work for the researcher.

9. For the most part, researchers were careful to identify their assumptions. They were not so careful, however, in their use of them.

10. In those studies which sought to establish the reliability and significance of statistical relationships, sampling procedures were reasonably well carried out. This was not true, however, in the normative type studies.

11. Related materials were used effectively as background material, but rarely were they used to verify the procedures of the study or justify the attempt to extend previous investigations.

12. Criteria were developed and employed in about a fifth of the dissertations. The strength of the criteria lay in testing the validity of them through logical thinking or submitting them to a jury of experts. In some cases, however, the researcher did not seem aware of the limitations of the "accredited jury" technique nor of the nature of criteria.

13. None of the studies was successful in determining cause and effect relationships. Rather, most of the studies of relationship were those in which associational relationships were established.

14. In general, agency sponsorship tended to result in the constructing of a better instrument and in securing a broader sampling of data. Only rarely was it apparent that agency sponsorship restricted the freedom of the researcher.

15. Few studies were specific extensions of earlier studies, nor did many of them attempt to test or validate previous research. Most of them, however, did point out problems which needed further study.

16. The researcher who was most rigorous in the application of sound research methods and therefore had reason to be most confident of the results of his study was cautious in the pronouncement of conclusions. However, the researcher who did not apply rigorous tests to his data and was less careful, skillful, and probably less capable in the use of sound research methods frequently cited a long list of conclusions.

Implications for Researchers

The following implications are focused on improving research in educational administration. Additional observations will be cited only as they help to provide the setting for the implication.

1. Rarely is it possible for an individual researcher in a single study to resolve all of the issues of an important problem. Rather, significant results usually emerge from painstaking research carried on over long periods of time, during which many approaches are made to the problem. These conditions for significant research have bearing upon the selection of problems by doctoral candidates. Had more of the researchers chosen

to extend or verify the work of the earlier researchers the attempt to close a serious gap in the research in educational administration would have been undertaken and it is probable that the final results of the studies would have been more significant.

2. Essentially each doctoral candidate must choose between selecting an important problem or selecting one of less significance. It would seem that the doctoral candidate should attempt to make an accurate appraisal both of his own potential for research and the significance of the problem. In the opinion of the writer, the researcher should attempt to overcome as many of the practical obstacles as possible in the preliminary exploration of the problem. Then, if the pursuit of a significant problem seems feasible, the researcher should hold himself accountable for making as great a contribution as he is capable of making. The researcher who does not pursue a significant problem nor one that challenges his highest capabilities seems to this writer to have abdicated his responsibilities as a doctoral candidate. On the other hand, it may be only slightly less desirable for the candidate to attempt a problem which he knows lies beyond his capacity.

3. Many of the dissertations reported in this study would have been more significant had it been possible to draw from them broader social implications. It appeared that some doctoral candidates launched into their studies with insufficient background for them. This resulted in some cases in the selection of unimportant problems or in not discovering the deeper meanings of a significant problem. The implication for the researcher is to delve into both the theoretical and the practical background of the study. It is probable that with a clear understanding of the fundamental issues the researcher will pursue the study less mechanically, will interpret the data more accurately, and will make clearer the relationships of the individual study to other researches.

4. Doctoral candidates need to differentiate the relative importance of various methods of research and the applications of them to particular kinds of data. For example, descriptive research, except as it may be used in certain historical studies, frequently does not contribute a great deal to the solving of basic problems. Survey type data rarely satisfy the test of any hypothesis. They do, of course, frequently suggest hypotheses for further study. Therefore the doctoral candidate might well regard normative research as a first step toward solving a problem, relying subsequently upon the application of other methods of research for making a significant contribution.

5. Researchers need to understand the relative value of new knowledge. Even from normative data new units or dimensions of a phenomenon may be obtained that have never before been known. Yet, even as new knowledge, these have little meaning unless they are related in some significant way to other data. Whether the relationships are utilitarian or

academic it is at the point that the validity and reliability of the relationships are established, that the researcher has made a contribution.

6. In the future, doctoral candidates should give serious consideration to the merits of longitudinal studies.

7. The social scientist sometimes excuses himself from employing rigorous research techniques on the grounds that the prediction of human behavior and the precise measurement of human attributes cannot be made. The implications for the doctoral candidate are: (1) He must not be content until more of the unknown about human behavior has been studied. (2) As the researcher, he must not hide behind the cloak of unpredictability. Upon the social scientist may lie the responsibility to develop and use new techniques not known to the physical scientist but which are nonetheless sound.

8. It would seem that had many of the researchers carried through a pilot study they would have gained considerable insight into the difficulties to be encountered and subsequently could have prepared themselves to cope with them.

9. A number of the doctoral candidates sought the cooperation of educational institutions or commissions. Another approach is for the individual to ally himself with a research commission already engaged in a worth-while project and from his work with them carry out for his doctoral study a phase of the larger problem. The latter approach has the advantage of working within a larger design which has had the benefit of the thinking of persons experienced in research activities.

Implications for Educational Institutions

1. A lack in the coordination of the research efforts of doctoral candidates seems to remain one of the weaknesses of research in educational administration. Most of the dissertations reported in this study represented single, isolated pieces of research. It would seem that the institutions' contributions in research would be much greater if they would develop long-range, over-all plans for research. This would involve careful selection of the more important problems, the development of a research design to encompass many individual studies and the encouragement of students to engage in the research. Such a plan might result in attracting outstanding candidates to an institution interested in pushing forward the research in a particular area. Furthermore, such a coordinated plan for research would tend to capitalize on a fuller background of experience within the institution whereas now it would appear that the energies of many researchers are expended without correspondingly significant results.

2. The approaches to research in the social sciences have been patterned rather largely after those of the physical sciences. Although these

approaches have tended to provide a degree of academic respectability, there is some question as to whether they have always yielded significant results. From this study it would appear that institutions should encourage the doctoral candidates to try new approaches in working with data. Admittedly first attempts might be rough and inadequate. Yet, one weakness now present could be avoided—namely, forcing into a traditional research mold, data which cannot be treated appropriately in the traditional manner. Such an implication for exploration in research methodology need not result in less rigorous attention to clear thinking, logical analysis, controlled conditions, and the testing of hypotheses.

3. As a counterpart to one of the implications for researchers, institutions might very well encourage doctoral candidates to engage in longitudinal research. The institution, more than the individual, can provide opportunities to do longitudinal study under a plan of coordinated research by the university.

4. Although it would probably be undesirable for an institution to adopt rigid regulations regarding doctoral research, the variation in the quality of studies at a given institution would suggest that faculties of an institution might well consider what constitutes acceptable research.

5. Research in educational administration at the various institutions might be strengthened through (a) encouraging students to pursue advanced work in disciplines related to educational administration, (b) developing common research interests with faculty members in related disciplines, (c) attempting to evaluate cooperatively the dissertations from other disciplines that bear on educational administration.

6. Institutions within a state and across the nation have a responsibility for the dissemination of information about research achievements at their institutions. At least two types of information are needed: (a) a statement of research problems which are being studied; (b) a brief annotation of the researches completed by doctoral candidates. This proposal, if it is to be of most value, involves developing an effective, yet simple plan for collecting and disseminating the research regularly.

Implications for Educational Administration

1. The review of the doctoral studies would suggest that the practicing administrator has two important concerns with research in educational administration. First, he should feel a responsibility for helping to identify the significant problems that need study. Second, in light of providing better answers for his use in administering educational systems, he should be concerned with improving the quality of the research. In relation to both of these concerns is the need to establish a clearing house for doctoral research so it is readily available to the practicing administrator.

2. Research in educational administration has not been coordinated sufficiently to make it possible to develop from it a theory of administration. The practicing administrator, of necessity, operates from day to day on information which has been determined largely on an *a priori* basis. A plan of coordinating and synthesizing research which would help in developing and integrating a theory of administration is needed badly. Undoubtedly, the time has come for a century-old profession to begin integrating its varying points of view into a systematic and dynamic theory.

California Educational Research Association Annual Conference

The thirty-fifth annual research conference of the California Educational Research Association will be held on March 15 and 16 at the Miramar Hotel in Santa Barbara. In an effort to make this year's meeting truly statewide the Association is holding the 1957 conference in the southern half of the state. Last year they met in Fresno, and for a number of years the conferences have been held exclusively in the northern half of the state.

The opening meeting will be held in the Conference Room of the Miramar Hotel at 8 p.m., Friday, March 15. Dr. James C. Stone of the Department of Education, University of California at Berkeley, will speak on "The University of California Experiment in Teacher Education." Two other general sessions will be held on Saturday. There will be five section meetings running concurrently throughout the morning and the afternoon of the second day in which research workers will report upon the methods and results of their newest research projects related to schools and education. Reports will be presented by Some of California's outstanding educational research workers, including representatives of city and county school systems, universities, colleges and junior colleges, and the State Department of Education.

Membership in the Association is open to all who desire to support educational research in California. The dues are two dollars a year which may be paid to the secretary-treasurer at the conference. The 1956-57 officers are: President, Edward Taylor, Alameda County Schools Office; First Vice President, Jack Holmes, University of California, Berkeley; Second Vice President, Hazel Lewis, Stockton City Schools; and Secretary-Treasurer, Glenn W. Durflinger, University of California, Santa Barbara College, Goleta, California.

The Local Research Program and the Research of Practitioners

STEPHEN M. COREY

During the next forty-five minutes I am going to try to do three things. First, I want to make some statements about educational research and the process of educational improvement that I believe to be true and which have helped me in my work with practitioners. Secondly, I want to describe what appears to me to be the process of change that results in improvement of professional behavior. Finally, I want to relate this process of change to things that might be done in a local research program to increase the assurance that educational changes will represent educational improvements.

Research and Improvement of Practice

My first belief is that the chief purpose of educational research is to improve educational practices. Education is effective depending upon the practices of those responsible for and those participating in the educational process. Knowledge, understanding, attitudes, feelings and sentiments about education are all important, but practices, and their consequences, ultimately constitute education. At least this point of view, as I have said, has helped me. It means, of course, that educational research is predominantly and unashamedly practical. It is, in some ways, analogous to medical research which is practical and is undertaken to improve what the medical practitioner does. Research in psychology, or psychometrics, history, sociology, economics or philosophy is related, in my judgment, to educational research in somewhat the same way as research in physiology, biochemistry or bacteriology is related to medical research.

A second belief or assumption that has helped me goes like this: Improvements in education are primarily a result of changes in the way people act. In other words, the betterment of educational practices requires

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that practitioners change what they do. This seems to me to be almost self-evident and suggests that the educational investigator, the educational researcher must be, in addition to everything else, a student of the process of change.

A third belief that has been useful to me is that people are more disposed to change, and more likely to improve—which is more than change—in groups than as individuals. There are many reasons, I presume, why this might be so. One important reason is the pressure exerted upon all of us by the norms and expectations of the groups to which we belong willfully and pridefully. Another reason is that the resources within a group, in some contrast to the resources of an individual, give added assurance that any problem will be dealt with more realistically.

Finally, I believe that the method of research, a procedure which requires increasingly rigorous and disciplined inquiry and experimentation, is an exceedingly promising way for groups of professional practitioners to improve what they do. I see this approach to improvement as being quite different from that which places major dependence upon authority or tradition.

These beliefs, and my experiences related to them, have caused me to have great confidence in research conducted by groups of practitioners—that is, by teachers, principals, superintendents and supervisors—in order for them to improve their professional work. By research I mean, increasingly careful and objective attention to the following elements in the process of inquiry: 1. Definition of problems; 2. Search for promising solutions; 3. Design of tests of these promising solutions; 4. Appraisal of the effects of these tests; and 5. Generalization to identify tentative guides for future practice.

For practitioners to become increasingly careful and objective and thoughtful in these respects is, however, not easy. Anyone who has tried it realizes that it is difficult. Most of us, under the pressure of our day by day work, leap from a vaguely defined difficulty into action to cope with it. Only infrequently, too, do we assess the effects of our action carefully to identify lessons that will help us in the future. In order to improve the quality of our problem solving, we need help which, speaking generally, has not been given us.

The fact that practitioners need help to improve the quality of the research they undertake to better their practices has, for me, clear implications for an effective local research program. I wish to develop these implications and do little else during my remaining time. Concentrating, thus, on the local research program's contribution to the training of practitioner-researchers is not meant to imply that the program should be concerned with nothing else. In my judgment, however, no other function of a local research program is comparably promising or important.

The only assumption I need make about a local program in order to develop my thesis is that one or more people have defined responsibilities in connection with it. There is, in other words, some professional personnel. The central problem then is, what can this professional personnel do to facilitate the work of teachers, administrators and curriculum leaders who are trying to use research as a method of self improvement.

The Process of Self Improvement

I should like to turn now to a consideration of the process of self improvement. In common, I presume, with most of you, I have tried hard to understand somewhat better what this process is like. To the degree that I can comprehend it, as it applies to myself and to others, I seem to be better able to exploit research procedures as a methodology of educational improvement.

I wish we knew more about the process of self improvement and the factors that influence it. Some people seem to be reluctant to experiment with their professional behavior, to try out new things. They go on doing what they have been doing. Others seem to find experimentation and change exciting and attractive. My hypothesis is that this kind of changeability is different from what we call native intelligence, and that it is a pervasive, temperamental disposition which manifests itself to varying degrees in particular fields of activity. I have friends, for example, who are very experimental in relation to food. They seek opportunities to try out different national dishes and are adventurous and exploratory in their own home cooking practices. Other friends of mine have eaten mashed potatoes, gravy, meat and pie all of their lives and intend to do so for the foreseeable future. Some people are experimental in their clothing—and I am not confusing this kind of experimentation with the rapid changes in dress dictated by fashion. I, personally, am quite experimental in my eating but find myself shamefully rigid so far as clothing is concerned.

Some day it may be possible to predict the disposition to change of prospective teachers, principals, curriculum coordinators and superintendents. The information could be used most advantageously in selecting people for admission to teacher education institutions or for professional positions in education. The resistance that some of us put up to change is so great as to mean that trying to train us is almost a waste of time and money. A teacher education program that involves students or teachers in service who are, on the other hand, *disposed* to change and to experiment would, almost inevitably, be effective. Similarly, if we were to appoint to leadership positions in education only those persons who not only represented advanced practice but also were disposed to modify and change their practices, the gap between what education is and what it ought to be would be appreciably reduced.

In my effort to learn more about the process of change as it is experienced by educational practitioners, I constantly ask people who are proud of some innovation in their professional behavior this question: "How did you come to do it?" "What is the process that led you to stop, for example, planning every single item of your high school staff meeting agenda and begin to involve the entire teaching faculty in the development of plans?"

This question, incidentally, is hard for most of us to answer. Our training, our education, has taught us to examine critically what we read and, sometimes, what we see. We have had little practice, however, examining our own experience to determine why we did something. Hard though it may be to do so, enough people have been able to comment on their experience as they changed to lead me to the tentative conclusion that the process goes something like this.

First, all of us are continuously appraising the effects of our professional activities. This we cannot avoid because we are, it appears, inveterate evaluators. This continuous running appraisal of the consequences of our professional behavior involves an examination of its relationship to our aspirations. Most of the time, our perception of the effects of our behavior does not disturb us particularly because it does not seem to be greatly out of line with what we aspire to do. When this is the case, we do not, of course, try to change, to improve.

But in the lives of all of us, there come times when we are upset, made uneasy, thrown out of equilibrium, by observing the effects of our professional behavior that are in sharp contrast with what we want. We may, of course, try to deny that this is our fault, but if the dissatisfaction persists, we decide that we must do differently, that we must change, that we must improve. This, in my judgment, is not only the first but the most important single aspect of the change process.

Just being upset, however, does not necessarily lead to change, as everyone knows. I have been vaguely uneasy about certain aspects of my own professional behavior for months, but the feeling was not strong enough to lead to the second phase of the change process. This second phase involves a much more careful assessment of the situation out of which the uneasiness grows. This more careful assessment is undertaken to determine, more specifically, just why our achievements, as we see them, and our aspirations are so different. This attempting to "define the problem," as we say, can be awkward and fumbling or skillful and effective.

After we see more clearly what difficulty we must cope with, we move into a more or less thorough search for practices that give promise of improving the situation that displeases us. This seems to me to be the third phase of the change process. To the degree that this search for more promising practices is undertaken with a research orientation, the process becomes complicated and difficult. It involves more than the exploitation

of numerous resources that might suggest these promising innovations. It also involves a critical examination of their use elsewhere and an imaginative projection of their use in a local and unique situation. This latter is essential in order to select among numerous possible practices a more limited number to be tested in an on-going, real situation.

After the strong feelings of discontent, and the more careful definition of what seems to be wrong, and the identification of something promising to try as a remedy, comes the development of a design for the "try out" that will make it possible to know, as realistically as possible, what the effects of the presumably better practices are. This question of experimental design is a troublesome one in the research of practitioners. So often a proposed plan is received with great enthusiasm, and an agreement reached "to try it out," but what "it" is vaguely understood as is a method of testing that will reveal whatever advantages the new practice may have. Frequently, too, what is alleged to be experimentation is carried on under circumstances that make it impossible to know whether or not subsequent effects are a consequence of the sheer passage of time, or the enthusiasm of the teacher, or the generally increased interest of boys and girls in strange and different kinds of work.

The final aspect of the change process is the reassessment of the total situation to determine whether or not the effects of the change are consistent with the good predictions. This kind of final assessment or evaluation, again, is often superficial and subjective. It is, of course, impossible to do an effective job of appraisal on the sudden inspiration, "it is time to get evaluation data." The final appraisal must be part and parcel of the total experimental design.

So much for a description of the change process as it seems to me to take place. The key words are dissatisfaction, assessment, search, design and appraisal. In the great majority of cases we are, of course, but vaguely, if at all, aware of these different phases as we move through them. Their sequence, too, is rarely as neat and obvious as my analysis has suggested. I do believe, however, that whenever change occurs—and by that I mean the kind of change that is consciously undertaken in order to improve professional practices—it does illustrate at one time or another each of these change phases.

What the Local Research Program Can Do

With this description before us I want to turn now to what the local research program might do to improve the quality of the change process. We can only have confidence that change is improvement to the degree that we are careful and thorough and objective as we: a. assess the instructional situation that disturbs us, getting as much evidence as we can to find out the relationship between our present practices and our intentions;

b. use many resources—books, articles, visits, the ideas of our associates—for suggestions about possible improvements in our behavior; c. introduce innovations in such a way as to know not only what it is that we are doing but also the effects of what we do, and finally; d. generalize from these effects to maximize our learning gains.

Let's look for a moment at the first phase of the change process. What can the local research program do to increase the likelihood that practitioners will continuously examine their aspirations and will get increasingly reliable and valuable data on the effects of their practices in relation to these aspirations. None of us knows a great deal about what research consultants can do to help in these respects. The practice that is tried most frequently is probably least promising. This practice involves the outsider, the consultant, telling the practitioner, maybe with some subtlety, that what he is doing needs improvement. A much more promising practice is for the consultant to do whatever he can to make it possible for practitioners to come together and talk about their work under circumstances that encourage candor and self scrutiny.

In my attempts to help people examine their purposes, and the relation between these purposes and their achievements I have not found the typical group problem census very helpful. Too often problems are identified about which there is no strong disposition to do anything. I have had more success encouraging discussions in which group members state what they would like very much to do but as yet have not been able to. This more positive and affirmative approach gets around to problems and difficulties in due course but not right at the start.

As I said a moment ago, aside from therapeutic situations, relatively little is known about things that may be done to encourage and help practitioners examine what they are doing and their aspirations in order to identify the kind of inconsistency that leads to change. This would be a good area in which personnel in local research programs might do some experimenting—some action research—of its own.

When the practitioner tries to get more precisely at the nature of his difficulty, the local research consultant, if he is wise, can be helpful. Few practices help more than a continuous encouragement to "get some data." This is the kind of thing that Hilda Taba and the late Ruth Cunningham, among others, have stressed with such great success in their work with teachers. In our work in the Horace Mann-Lincoln Institute of School Experimentation we have found that many practitioners talk quite vaguely, though often vigorously, about their difficulties. Most of us, as a matter of fact, converse about our own work difficulties without much discipline or any clear conception of a somewhat scientific method of problem solving. We confuse opinions with facts, speculations with conclusions; and our

motivation to think and talk in quantitative terms is very weak. One of the first things we try to do in our Institute group work is to establish some norms that place value upon differentiating between opinion and fact and upon references to data, to evidence, to information. Unless something of this sort is done, we frequently either define out of the total troublesome situation problems we subsequently find we do not want to work on or we do go to work on what turns out to be the wrong problem.

This latter situation was illustrated in one of the Institute's projects which I have already described to some of you. A small group of primary grade social studies teachers had experimented for 18 months with new methods and materials and the data they procured on the effects of their experimentation were most encouraging. A long staff meeting was held during which the experimenting teachers reported their experience and urged that all other teachers in the same grades adapt and use the same methods and materials. There was considerable enthusiasm for this. When the chairman put the question, all of the non-participant teachers said they wanted to do it, too.

As time went on, however, it became clear that these teachers that had not participated in the experimentation were not changing their practices. This led to considerable uneasiness on the part of some of the leadership and an attempt to find out what "was really wrong." In interviews with teachers, the comment was made again and again that these new methods took too much time and that the teachers were so burdened with routine activities that they could not get around to doing what they really wanted to do.

This having been identified as the problem, a great deal of trouble was gone to in order to relieve teachers from some of the onerous details they said were consuming their time—like paper drives. Considerable success was met in reducing the routine tasks of the teachers, but, such is this world's sadness, no increased experimentation with the social studies program was visible.

This led to a great deal of concern and a much more careful inquiry to determine what was wrong. This inquiry had to be careful because what actually was wrong was not that the teachers didn't have time. They didn't know what to do. It is much easier to say you don't have time than it is to say you don't know what to do. When it did become clear that the lack of spread of these demonstrated practices was a consequence primarily of the fact that the teachers had never learned how to engage in them, in-service training was undertaken which proved to be quite successful.

The local research consultant is quite apt to be trapped himself at the problem definition stage. He finds himself in this embarrassing situation less frequently, however, to the degree that he keeps pushing, gently and with circumspection, for evidence about the problem.

After some agreement has been reached by the researching practitioners as to the nature of the difficulty they must deal with, they begin their search for what to do about it. It is at this stage, it seems to me, that the personnel in the local research program can be of benefit by helping the practitioners to learn about the relevant research and enlightened speculation that are already available. A great deal of operational or action research is disappointing because it is repetitious and does not involve taking advantage of what already is known. It is important, however, for the research consultant to recognize that it is not easy to take advantage of what is known. To assume that because an expert knows something and tells the practitioner, the practitioner can take advantage of what he is told, is a snare and a delusion. Research consultants need much more ingenuity than most of us have if we are to help practitioners become acquainted with and perceive the pertinence of the accumulated experience of others who have tried to deal with similar problems.

I recall working with a group of teachers who were convinced that an emphasis in American history classes upon the biographical method would result in improvements in the character of their pupils. During a rather long period of time when this belief was being discussed and prior to the design of any test of it, I talked a lot about research that had been conducted to determine the effect of direct moral instruction upon behavior. The classic studies by Hartshorne and May, for example, were cited and analyzed but, either because of lack of consultant skill, or because of some absence of readiness, all of this body of pertinent literature and information dealing with analogous situations was just overlooked by the experimenters.

The next phase of the practitioner research process, designing the experiment or designing the trial, calls for considerable technical skill. This is a kind of skill, too, that people who have leadership responsibility in the local research program are quite apt to have. Much of the graduate training intended to make us better educational investigators has concentrated upon design problems. I have found that one of the most effective things that I seem to be able to do as a research consultant to practitioner investigators is to try to make design and its importance highly visible. This is almost always initiated by trying to get a verbalized step by step description of what is to be done and why.

In training situations at Teachers College where we try to help curriculum people become more systematic in their problem solving procedures, a great deal of actual practice is provided in the description of experimental designs for testing certain practical hypotheses. The temptation, of course, when attention is being given to design by the highly skilled investigator is for him to be so impressed by the necessity for controls that he gradually abstracts the research situation clear out of this living world.

Frequently in the kind of research I am talking about, niceties of design have to be sacrificed because of practical exigencies. Again, though, granting these difficulties, the research consultant who is aware of design problems and can communicate what he knows, helps the experimenting practitioner greatly.

Finally, of course, after the innovation has been in effect for a period, data regarding its effectiveness must be accumulated, and these data interpreted. Here the disposition of most of us practitioners is to take data at their face value and be almost completely oblivious of problems of sampling or reliability or validity. These problems, however, are not beyond the ken of intelligent people. Teaching about them can be direct and effective whenever people realize that what they learn will help them improve their professional behavior. In relation to procuring evidence, and to measurement and statistics the trained investigator or educational researcher has accumulated a great deal of skill and information. Communicating what he knows, however, is not at all easy.

Sometimes what appears to be a casual conversation can result in an appreciably greater attention to getting data on effects. Here is an illustration:

Teacher A: It was wonderful, just wonderful! He recited all 30 verses without a mistake. And with so much feeling!

Teacher B: You feel real good about those youngsters reciting poetry, don't you?

Teacher A: I certainly do. They learn so much.

Teacher B: I suspect you're right. What kind of things do you see them learning, for example?

Teacher A: Oh, to love good poetry for one thing.

Teacher B: Well, that's certainly worth learning.

Teacher A: I think so, too.

Teacher B: I wish I were sure of a good way of finding out whether or not ninth graders were improving their taste in poetry. I'd like to push them off the limerick level and be sure they stayed off.

Teacher A: Oh, I guess I can just tell when they are enjoying it. At least, I'm pretty sure I can.

Teacher B: It would be interesting to find out if they read a bit of good poetry on their own, wouldn't it?

Teacher A: Yes, it would. They say they do. Or many of them say that anyway. How else could I find out?

Teacher B: Oh, I'm not sure. It might be interesting to take a look at what they choose during free reading periods.

Teacher A: That wouldn't be too hard, would it?

Teacher B: No. Another thing might be to have them finish an incomplete story about a ninth grader who, say, "strolled into the library, his studying finished, and went directly to the shelf for . . .". Some good book on evaluation probably could help here.

Teacher A: You know, I might do that unfinished story business at the beginning and end of the semester.

Conclusion

During the past ten or fifteen minutes, I have tried to indicate, by concentrating on the process of change, some of the responsibilities of the local research program if it is to help practitioners conduct inquiries and experiments with increasing rigor and objectivity and thoughtfulness. As I have said several times, the reason for this increased rigor and objectivity and thoughtfulness is to increase the likelihood that changes in practice that grow out of experimentation will represent actual improvement.

In our work in the Horace Mann-Lincoln Institute, we have found that anyone who hopes to be of much benefit to practitioners who are conducting research to improve their practices must develop special competence along at least two dimensions. First he must be a skillful teacher of those group processes that enable people to communicate better with one another to the end that they can muster as many as possible of their resources to deal with practical educational problems. The second dimension has to do with the methodology this group employs in its problem solving. We have learned, too, that we must first give major attention to building a group and subsequently concentrate on research methodology.

In the university training most of us have had as educational researchers, relatively little attention was paid to the conditions that must obtain if groups of practitioners are to improve their research methods. Relatively little attention was paid, too, to what needs to be done in order to teach practitioners to conduct research. It seems to be assumed that anyone who has himself learned how to do research can teach others. I suspect that there is no more relationship between an individual's ability to conduct good research and his ability to teach others how to do it, than there is between the ability of a person to play a good game of tennis and his ability to teach someone else to play the game.

In conclusion, I would like to recommend that those of you who are interested in what can be done to encourage practitioner research, be sure to get the forthcoming A.S.C.D. Yearbook entitled *Curriculum Research*. A. W. Foshay and James Hall were co-chairmen of the production committee. Among the other authors are Margaret McKim, Hilda Taba, John T. Robinson, Virgil E. Herrick, Matthew Miles, and Ronald Doll, all of whom had extensive experience with cooperative field research, and they write about it thoughtfully and lucidly.

I would also like to call to your attention a little book a group of us in the Horace Mann-Lincoln Institute of School Experimentation wrote entitled *Training Curriculum Leaders for Cooperative Research*. This booklet describes a 14-month program of leadership training and, if it does nothing else, calls attention to a few practices that may not be worth repeating.

Physical Maturing Among Boys as Related to Adult Social Behavior

A LONGITUDINAL STUDY

ROBERT AMES

The influence of rate maturation upon the social behavior of adolescent boys has been investigated by Jones and Bayley (7), who found consistent differences in favor of early-maturing boys, as measured by skeletal age indices from X-rays, on such variables as popularity and attractiveness, as measured sociometrically by an opinion test. The present study is concerned, not only with the relationship of maturation rate to adolescent social behavior, but also with the relationship of this variable to the social behavior of males in adult life.

This study is part of a larger longitudinal investigation of 40 males and 40 females in which an attempt was made to determine the long-term predictive value, or consistency, of measurements of social participation and leadership which were obtained during adolescence (1). Rate of maturation during adolescence was considered, at the beginning of the original study, to be simply one of the "additional variables" which, among other antecedents, should be examined with regard to a possible contributing influence. It soon became apparent, however, that for the men of the sample, physical maturation rate during adolescence was more highly related to adult social behavior than were the various measures of adolescent social behavior. A complete report of the original study will be made elsewhere, but it was felt by the investigator that the effects of maturation would be of interest to educators.

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Data and Procedure

The subjects of the present report were 40 men who were members of the Adolescent Growth Study of the Institute of Child Welfare at the University of California, Berkeley, California. The Adolescent Growth Study is a longitudinal investigation of the social, intellectual, and physical development of a group of boys and girls, originally over 200 in number, who were studied between the years 1932 and 1938, when they were between the ages of 11 to 18 years (4, 5, 6). The present study is part of a larger follow-up of these same subjects at an average age of approximately 33 years.

The roentgenographic technique for determining physical maturity in terms of skeletal age is described elsewhere by Bayley (2). This procedure, which involves taking X-rays of the hands and knees at a standard distance, gives a highly reliable index of skeletal development by means of epiphyseal closure, appearance of carpals and amounts of ossification. Skeletal age indices obtained during the preadolescent and adolescent years were available for the subjects of this study. Scores of skeletal age divided by chronological age during the 14th to 17th years of life were averaged for each individual in order to obtain an index of his relative rate of maturation. The resulting ratios were then converted to standard scores. A high score indicates early skeletal maturation.

Ratings of the adolescent social behavior of these subjects were available in the form of standard scores. Two types of observer-ratings were obtained, the "ICW" ratings and the "Clubhouse" ratings.

The ICW ratings of "sociability" (among other traits) were obtained during one-hour observations of these subjects in same-sex, free-play, small group situations. Independent observations were made by at least three adult observers (8).

The Clubhouse "popularity" ratings were made over longer time intervals and for a much wider variety of behavior. Subjects were observed in both same-sex and opposite-sex situations, in small groups and in large groups, during organized activities and during informal gatherings.

Opinion Test "popular" ratings are peer-ratings in the form of an opinion test patterned after the "Guess Who" test of Hartshorne and May (3). This sociometric device was employed to obtain the adolescents' judgments of one another in terms of social behavior. A description of the procedure is reported by Tryon (9).

Many other variables for both sexes, such as intelligence test scores, years of education, parental socioeconomic status, and adolescent measures of leadership, height, weight, and strength, are investigated in the larger study of which this report is a part, but for the purpose of brevity these will be reported upon elsewhere.

Direct interviews were used as a part of the follow-up procedure. The interviews were standardized, semi-structured and open-ended. Answers to the interview questions were rated on seven-point scales independently by two-raters. Raw scores obtained by this procedure were combined and converted to standard scores.

Three types of adult social participation were considered to be of value for investigation. These were "informal social participation," "formal social participation," and "occupational social participation."

Informal social participation was defined and rated in terms of the frequency with which the subjects entertained, or were entertained by, friends, relatives, casual acquaintances, etc. Also included in this category were various sports and hobbies more or less socially oriented in nature.

Active membership in clubs, societies, and other structured organizations was considered to be an index of formal social participation. Mere nominal membership was given no weight in the ratings.

Occupational social participation was quantified by rating the occupations of the men in terms of the relative amount of social contact which was afforded by them. Judgments were aided by supplementary statements from the subjects as to the amount of social participation involved in their occupations.

Adult leadership was defined in terms of occupational status and organizational officership. The Warner Scale of occupational status was used, supplemented by ratings of the interview protocols in terms of the subject's evident position within his particular occupation. Officership of formally organized activities was found not to be a continuously distributed variable in this sample. The individuals either held some position in an organization, or they did not. Organizational leadership was therefore treated operationally as a dichotomous variable.

TABLE I
Rater Reliabilities

	Correlations (r) Between Ratings ^a	Standard Error of r
Informal Social Participation	.83	.05
Formal Social Participation	.93	.02
Occupational Social Participation	.91	.03
Occupational Status	.83	.05

^a Ratings of responses to interview items were made independently by two raters.

Results

The independent ratings made by two judges of the interview protocols are substantially high in agreement, as may be observed in Table 1.

Pearson product-moment correlations were computed by the well-known machine formula. The 28 *r*'s resulting from intercorrelating eight variables are shown in Table II.

TABLE II
Intercorrelations of Selected and Adolescent Measures

<i>Variables</i>	<i>No.</i> <i>1</i>	<i>No.</i> <i>2</i>	<i>No.</i> <i>3</i>	<i>No.</i> <i>4</i>	<i>No.</i> <i>5</i>	<i>No.</i> <i>6</i>	<i>No.</i> <i>7</i>	<i>No.</i> <i>8</i>
<i>Adult Measures</i>								
No. 1 Occupational Status	.40a	.22	.51b	.10	.09	.14	.47b	
No. 2 Informal Social Participation		.38a	.39a	.26	.39a	.23	.48b	
No. 3 Formal Social Participation			.16	.13	.00	-.05	.44b	
No. 4 Occupational Social Participation					-.04	.26	.14	.35a
<i>Adolescent Measures</i>								
No. 5 ICW "Sociability"						.56b	.18	.39a
No. 6 Clubhouse "Popularity"							.48b	.24
No. 7 Opinion Test "Popular"								.37a
No. 8 Maturation Rate (Skeletal)								

a Significant at the 5 per cent level.

b Significant at the 1 per cent level.

Reference to Table II, Row 8, Columns 5 and 7, indicates that skeletal maturation rate is related to the adolescent measures of ICW "Sociability" and Opinion Test "Popular" at the 5 per cent level of confidence. These relationships tend to confirm the findings of Jones and Bayley, mentioned earlier.

Of more importance for long-term predictive purposes, however, are the correlations shown in Rows 5, 6, 7, and 8, Columns 1, 2, 3, and 4. These correlations indicate that skeletal maturation rate is more highly related to each of the adult measures of social behavior than are any of the adolescent measures of social behavior.

Clubhouse "Popularity" is the only measure of adolescent social behavior which correlates significantly with any of the adult ratings. The correlation of .39 with Informal Social Participation is significant at the 5 per cent level and is reasonably linear in form. The *r* of .48 between Maturation Rate and Informal Social Participation, however, is significant at the 1 per cent level.

None of the adolescent ratings of social behavior correlates significantly with the adult measures of Formal Social Participation or Occupational Social Participation. Skeletal Maturation Rate, however, is significantly related to both of these adult measures.

The ratings of the three types of adult social participation were combined in order to obtain scores of Total Participation. The r between Total Social Participation and Clubsouse "Popularity" is only .32. None of the other ratings of adolescent social behavior is significantly related to Total Social Participation. Maturation Rate, however, correlates .52 with Total Social Participation.

The group was divided into three categories to be called, respectively, "early maturers" (Maturation Rate above a standard score of 50), "average maturers" (Maturation Rate 50), and "late maturers" (Maturation Rate below 50). It is noteworthy that only one late maturer is above the mean of Total Social Participation.

Fifteen of the males of the sample were found to be in occupational positions which require that they supervise or direct the work of subordinates. Of these fifteen subjects, only three were late maturers. A biserial r of the two groups (directors and non-directors) with Maturation Rate yields a coefficient of .51, which is significant at the 1 per cent level.

Only eight of the men in this study hold offices in any type of social organization, club, lodge, or civic group. Not one of these "organizational leaders" was a late maturer. The mean maturation rate of the leaders was 58.13. The mean maturation rate of the non-leaders was 47.9. Because of the small number of organizational leaders found in this sample, a statistical analysis of these differences would be psychologically meaningless, but the fact that these differences exist is consistent with the other findings of this study.

Discussion

There appears to be little doubt that, for the males in this sample, rate of maturation during adolescence, as measured by skeletal age indices determined from X-rays, is a better predictor of the adult social behavior herein defined than is any other variable included in the present study. If the investigator were to accept only the 1 per cent level of confidence as a test of the null hypothesis, none of the ratings of social behavior made during adolescence could be considered to be significantly related to any of the adult measures of social behavior. Skeletal maturation rate, however, would remain significantly related to occupational status, informal social participation, formal social participation, total social participation, the supervision of subordinates in occupations, and possibly to officership in organizations.

The early-maturing boy is recognized by his peers and by adult observers as being socially active and popular. It is highly probable that, with his physical superiority and his earlier acquisition of more adult drives and attitudes, he acquires patterns of success with his peers which tend

to persist over time. It is hypothesized by this investigator that early maturation for boys is accompanied by physical, psychological, and social advantages which remain rather stable. Early maturers tend to either become or remain socially active in adulthood, whereas late maturers tend to either remain or become less socially active as a group.

The results of this study, and of the larger study from which it is taken, indicate that the stress placed upon social participation in the school may be somewhat overemphasized in terms of any value for future social behavior. The sociability and popularity of adolescent boys has, at best, a very low relationship with their social participation in adult life. Any "transfer" value of social behavior in the school is found, for males, to lie only in the area of informal social participation (particularly in socially oriented sports and hobbies) in adulthood. This is not to state that social participation should not be encouraged or supported in the schools. Such experience may well have some value for those who are successful in their social relationships during this period. But those males who are successful at both the adolescent and adult level are found, in this study, to be the early-maturers. Unless some measures can be taken to assure continuing successful social experiences for the less fortunate members of the school society, it is highly doubtful whether social activities programs in the schools will be of much measurable value to them in later life.

Several factors limit the general applicability of this study. The sample used is necessarily of a somewhat select nature in terms of socioeconomic status, intelligence, years of education, and geographical location. The sample is perhaps also select in the very fact of its availability for a 15-year follow-up.

Ideally, the ratings of adult social behavior should have been made by direct observation in order to be more nearly comparable to the adolescent measures. Practically, this procedure was of course impossible. The investigator had to depend upon behavioral self-report from the subjects, supplemented where possible by verification. Further research should of course include another follow-up of these same subjects in another fifteen years, when they have presumably reached somewhat of a "peak" socially and occupationally. The small *N* is a definite statistical limitation of the present study. The findings of this study should be cross-validated with larger groups of subjects from differently selected populations.

Of particular interest to this investigator were the relationships found between skeletal maturation rate and the social variables for the males of the sample. The consistency with which maturation rate relates to both the adolescent and the adult measures is noteworthy. Jones and Bayley (7) have previously pointed out the clear evidence of the effect of physical maturation upon the behavior of adolescent boys, and the reliability and

stability of skeletal age indices as measures of maturation. Further evidence would be desirable, in view of the findings of the present study, on the long-term effects of this essentially physical variable.

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Directory for Exceptional Children, 1956, edited by E. Nelson Hayes
Boston: Porter Sargent Publisher, 1956. 247 pages. \$4.00

This directory contains descriptions of more than 1800 public and private schools, clinics, homes and other facilities for the mentally retarded, cerebral palsied, orthopedically handicapped, emotionally disturbed, socially maladjusted, blind, deaf, cardiac, and epileptic. Included also are listings of psychiatric and guidance clinics, speech and hearing clinics, state programs and personnel, and associations, as well as an extensive index.

This is the only reference work available to the rapidly growing field of special education, and has been compiled after much correspondence with thousands of teachers, school administrators, doctors, psychiatrists, social workers, and others. It is a book which should be widely known as an invaluable help to parents and others seeking services for the more than three and one-half million children who are handicapped.

A Longitudinal Study of Learning by Medical Students

PETER G. LORET AND RICHARD B. WEST

In evaluating the achievement of medical students throughout the United States in the subject matter of cancer, the Education Project of the Cancer Research Institute of the University of California has obtained data relative to their knowledge of cancer at different levels of their medical education. Since the "Examination for Students of Medicine in the Subject Matter of Cancer" has been administered annually to voluntarily participating schools since 1949, it is possible to obtain test scores for students for each of the four years of their medical education.

This investigation is an attempt to determine the nature of cancer learning in terms of gains in knowledge, as well as the rate and nature of these gains. It is based on an analysis of the test performance of a randomly selected, representative sample of medical students who have taken the Cancer Test annually for a consecutive four-year period.

Methodology

The Sample. Using Neyman's method for obtaining a sample representative of all participating schools (1:459-461), a sample of four hundred students was randomly selected from a group ($N=2,341$) who had taken the Cancer Test as Freshmen in 1951 and in each of the three subsequent years of their medical education.

In order to determine at each academic level whether the sample of four hundred was truly representative of the population from which it had been drawn, the null hypothesis that no significant difference existed between the means of the population and sample was tested. The *t*-test

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indicated no significant differences between the means at any academic level, and the null hypothesis was therefore accepted.

Analysis of the Data. To obtain a sample of performance which would be comparable throughout the years under consideration, only items which remained completely unchanged, or which involved only minor revisions, such as punctuation, spelling, and the like were retained for the present analysis. The number of items thus obtained was sixty. The number of correct responses to each of these items was counted for the four hundred students for each year (Freshman through Senior). These data were converted to per cent correct for each item at each academic level. To facilitate the analysis of these data, the items were then separated into groups by site of the neoplasm involved, and by the categories of diagnosis, characteristics, and treatment. The number of test items dealing with each site and category may be found in Table I.

TABLE I

Number of Cancer Test Items Dealing with Each Site of Neoplastic Disease and Average Per Cent Correct for Each Class

Site	Number of Items	Average Per Cent Correct for Each Class		
		Freshmen	Sophomores	Juniors
Skin	7	25	55	75
Head and Neck	5	31	46	63
Chest	5	31	43	61
Endocrine Glands	5	27	52	71
Digestive System	12	23	50	68
Urinary Tract	3	16	44	70
Male Genital	2	42	73	93
Female Genital	4	25	40	60
Breast	5	31	58	75
Bone	2	19	48	58
Soft Tissue	2	14	50	64
Nervous System	3	42	58	68
Lymphomas and				
Leukemia	2	44	58	66
Unspecified	3	27	54	67
Total—All Sites	60	28	52	69
				76

The average per cent correct for the sites and categories of diagnosis, characteristics, and treatment were computed for each year and plotted in the form of a learning curve. The data are presented in numerical form in Table II (on page 78).

TABLE II

Number of Cancer Test Items Dealing with the Diagnosis, Characteristics, and Treatment of Neoplasms, and Average Per Cent Correct for Each Class

Category	Number of Items	Average Per Cent Correct for Each Class		
		Freshmen	Sophomores	Juniors
Diagnosis	19	30	48	66
Characteristics	31	23	50	67
Treatment	10	37	61	76
Total—All Categories	60	30	53	70

Results and Analysis of Findings

The results of the analysis are presented in Figures 1 and 2. Figure 1 presents the curves for various sites of cancer¹, while Figure 2 compares the categories of diagnosis, characteristics, and treatment. (Normally, in reports to the participating schools the data are broken down further within each of the sites into these categories. However, in the present analysis, this was not feasible since the number of items would have been so reduced as to make the results unreliable.)

Considering the data presented as a whole, some general statements of a descriptive nature may be made. All of the learning curves indicate that knowledge of cancer at the Freshman level, regardless of the site involved, tends to approximate the level of chance. On a multiple-choice test of this type, in which each item has five choices, a student who does not know the answer to an item has, theoretically, one chance in five of guessing the correct response; this, of course, assumes that each response has an equal chance of being selected. Therefore, the average per cent correct to be expected by chance alone is one-fifth of the total possible number of correct responses, or twenty per cent of the test. It is interesting to note that almost all of the curves, with several minor exceptions, fall near this level at the Freshman year.

As might be expected, by one familiar with the curricula of the medical schools in the United States, the greatest amount of cancer learning takes place during the Sophomore and Junior years, particularly in courses dealing with pathology. The curves in the Figures seem to verify this trend, since the major increments in knowledge of cancer take place during the Sophomore and Junior years.

¹ Curves for only 7 sites are presented in this figure because of the similarity of those for all the sites. Other data not shown in this curve are found in numerical form in Table I.

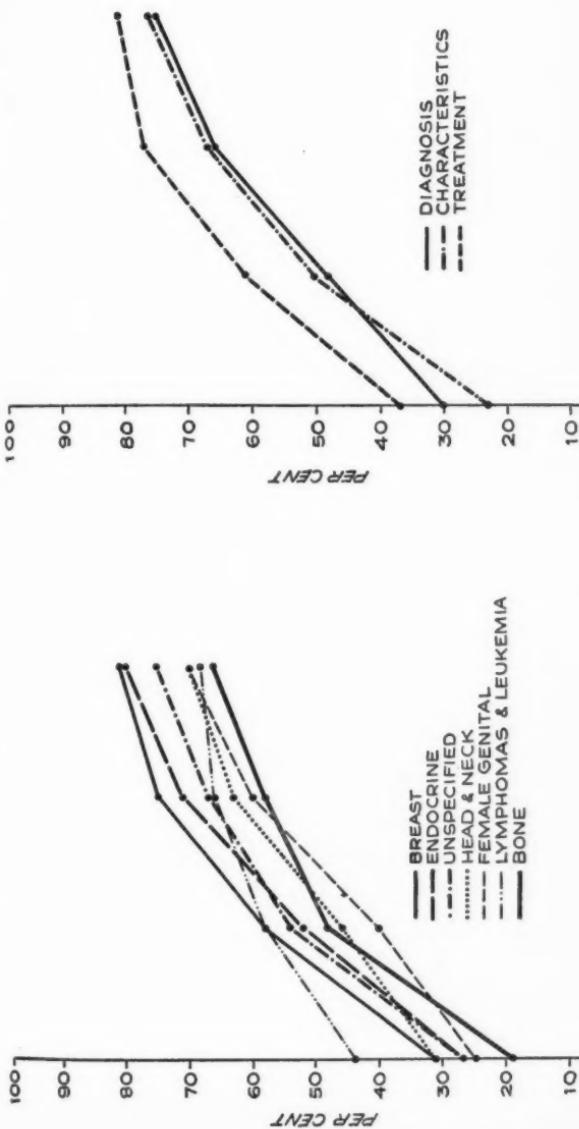


FIGURE 1. Increase in Average Per Cent Correct for Items Dealing with Certain Anatomical Sites of Cancer.

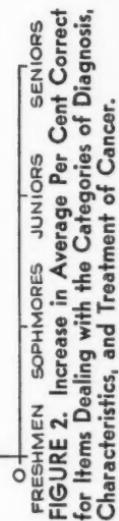


FIGURE 2. Increase in Average Per Cent Correct for Items Dealing with the Categories of Diagnosis, Characteristics, and Treatment of Cancer.

Although the majority of the curves show a definite leveling-off during the Senior year, this trend does not necessarily imply that less learning takes place during that period. One should be aware of the pitfalls which occur in the interpretation of the per cent statistic; namely, that it does not consist of equal intervals, and hence that a gain of five points from 80 to 85 per cent represents an entirely different amount (and perhaps quality) of learning than a similar gain from 50 to 55 per cent. Nevertheless, the leveling-off of these curves is of some significance and is not entirely unexpected. One must remember that the greatest amount of formal instruction in cancer is given in the second and third years of the medical students' training (primarily in pathology courses). In the Senior year instruction becomes much less formal and is usually concerned with clinical application of previously acquired principles and techniques. Therefore, considering the informal type of instruction involved, one would expect that the gains in factual knowledge would be somewhat less than at the lower levels of instruction in medical schools. It may also be that an integration of previously acquired knowledge takes place at the upper levels of medical education (2).

In terms of the categories of diagnosis, characteristics, and treatment (Figure 2), it is of interest to note the great similarity of the learning curves for knowledge of diagnosis and characteristics of cancer, and the relative superiority shown by the curve illustrating treatment. Although one might consider the data for the treatment items to be somewhat unreliable when compared to the other two categories (because of the smaller number of items involved), other data on file in the Education Project tend to confirm this trend. One might assume that this difference may well be due to the fact that there tends to be less disagreement concerning the treatment of cancer, once a definite diagnosis has been established, than there exists in the actual diagnosis of the disease and its characteristics.

Practice Effect vs. Learning

In a study of this nature, one must be aware of the fact that the repeated use of test items year after year on a single group of individuals may tend to artificially augment the amount of gain shown. This problem is not a new one since any achievement testing program which uses item analyses to select and retain the better discriminating items for future use may encounter this difficulty. In a study devoted to this problem and dealing specifically with the Cancer Test, Towner and Galloway (3) found that students were able to differentiate significantly between old and new items in terms of recognition, but that no significant correlation existed between the number of old items a student correctly recognized and improvement in his score during three administrations of the examination.

To investigate further the possibility of a gain due to memory for test

items the following analysis was made. It was hypothesized that the length of time during which an item had appeared on the Cancer Test would cause an increase in the average per cent correct of items for Senior classes over a four-year period. The per cent correct for all the Senior students taking the test in the United States during the years under consideration (1951-54) was determined for each of the items. Having obtained the average per cent correct for each item, the 1951 Senior data were then used as a base and gain or loss from this level was determined for each year. It was found that between the years 1951 and 1952 the average gain among these sixty items was 1.57 per cent. By the end of the second year, these items had, on the average, gained 3.62 per cent over 1951, and by 1954 the average per cent gain was 4.93. On the basis of these figures one might expect an average gain of five per cent for an unrevised item appearing in the test over a four-year period, and this might possibly be ascribed to memory of items. However, it is more than likely that this variation represents differences in teaching, differences in student preparation for the test, and many other variables rather than memory of test items. As Towne and Galloway pointed out in their article, the students see a given test for less than two hours once a year and it is highly unlikely that a conscious effort on their part would be made to memorize the test items, particularly in view of the fact that none of the participating schools uses the Cancer Test as a means of grading students. The test, as used by the schools, is primarily a method of evaluating the teaching program of a school as a whole rather than a means of grading any individual student.

In view of the foregoing, it would seem that the trends in the cancer learning of medical students as shown by Figures 1 and 2 are indicative of actual learning, and are not affected to any significant degree by students' memory of test items. It would also seem highly probable that the average Senior graduating from medical schools today is better informed concerning the various aspects of cancer than was the graduate four years earlier.

Summary and Conclusions

This investigation is a longitudinal study of a representative, randomly selected sample of four hundred medical students who have taken the "Examination for Students of Medicine in the Subject Matter of Cancer" in each of the four years of their medical education. It is based on sixty test items which remained identical in content and wording during this four-year period. These items were grouped by site of neoplasm and by the more general categories of diagnosis, characteristics, and treatment of cancer. The average per cent of students responding correctly to each item was computed for each academic year and these results were plotted in the form of learning curves. The findings of this investigation may be summarized as follows:

1. Regardless of analysis by site of cancer or by categories of diagnosis, characteristics, and treatment, the greatest gains in cancer learning appear in the Sophomore and Junior years. It was hypothesized that this was probably due to the instructional emphasis on pathology in these years.
2. Knowledge of cancer during the Freshman year falls near the level of chance; that is, it approximates the score which might be obtained by a student who took the Cancer Test and guessed at all of the items.
3. The majority of learning curves show a leveling-off at the Senior level of instruction. This may be due to the nature of the per cent statistic or it may indicate that an integration of previous cancer learning is taking place.
4. Knowledge of test items dealing with the treatment of cancer exceeds that of items dealing with diagnosis and characteristics at each academic level. This may be due to the relative concurrence of opinion concerning the treatment of cancer, once a diagnosis has been established, as contrasted with less agreement regarding the diagnosis and characteristics of neoplastic disease.
5. The possibility that these data might be affected by memory for the items was considered and investigated, and it was concluded that this factor did not operate to any significant degree.

A more detailed analysis might have been made of cancer learning by site of the neoplasm, but it was felt that due to the probable unreliability of data based on small numbers of items this step was not warranted.

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An ABAC for Estimating Certain Systematic Error

WILLIAM B. MICHAEL, ROBERT A. JONES,

AND NORMAN C. PERRY

That a systematic error exists in the estimation of levels of item difficulty p for a total criterion sample from an average p_E of the proportions of individuals in the upper and lower 27 per cent-criterion groups who respond in a designated manner has been demonstrated both analytically (3) and empirically (2) when a normal correlation surface is assumed to describe the nature of the relationship between responses to an item and the criterion variable. Although the amount of error is not substantial for items with validities in the vicinity of .40 or less, discrepancies between p_E and p in excess of .015 commonly occur for higher item validities when the level of item difficulty p_E falls between .60 and .90 or between .40 and .10.

It is the purpose of the writers to present an abac that will permit for a known degree of item-criterion correlation r_t an estimate of the amounts of error that arise in the determination of item difficulty p for a total criterion group when upper and lower groups, each of which consists of approximately 27 per cent of the total criterion sample, are employed. Based on use of Pearson's Tabulation (4), the procedure for obtaining estimates of the amount of error has been described elsewhere (1). The abac is presented in Figure 1.

If p_U and p_L represent the proportions of individuals in each of two extreme groups of an entire criterion group who respond in a specified manner, an experimentally derived estimate of item difficulty is given by $(p_U + p_L)/2$, which is defined as p_E . If p designates the actual proportion of individuals in the entire criterion sample who respond in the same manner, then the amount of systematic error will be given by $p_E - p$. It has been shown previously that when $p > .50$, $p_E - p < 0$ and that when $p < .50$, $p_E - p > 0$ (3). In other words the indices p_E tend to be closer to .50 than do the corresponding indices p for the same degree of item-criterion correlation.

A note about the authors appears on page 86.

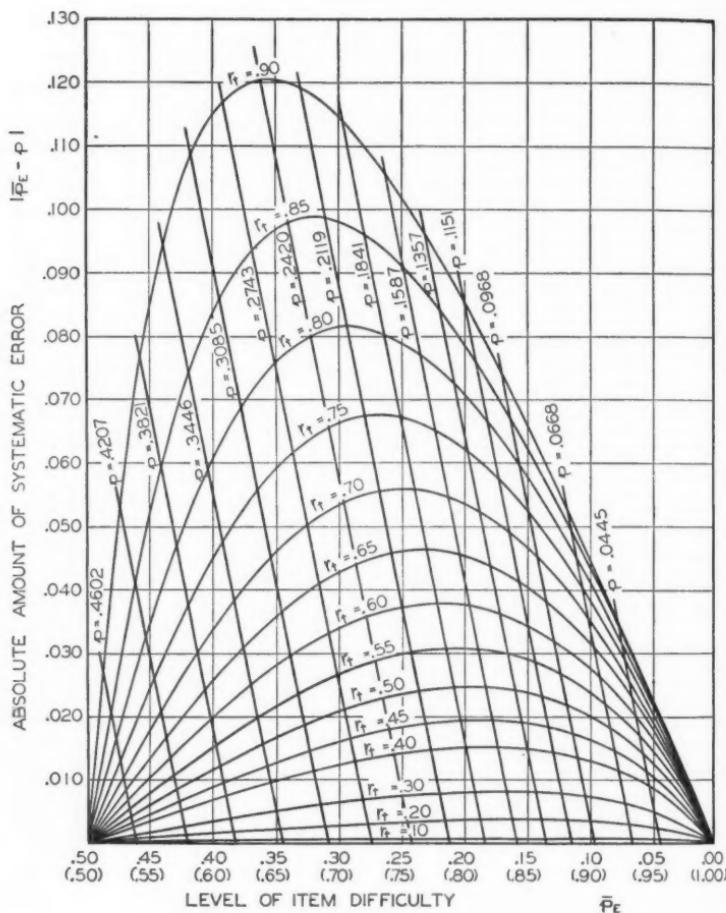


FIGURE 1
An ABAC for a Graphic Estimate

This ABAC makes possible a graphic estimate of the amounts of systematic error arising at different levels of item-criterion tetrachoric correlation from use of an index of item difficulty based on an average of the proportion of individuals in the upper and lower extreme groups who respond in a designated manner as an approximation to the index item difficulty for a total criterion sample when the proportion of individuals in each extreme group is approximately 0.27 ($p' = 0.2743$).

In the abac it will be seen that along the abscissa the experimentally observed indices p_E are shown by steps of .05. Along the ordinate the absolute differences $|p_E - p|$ are indicated. For values in p in excess of .50 these differences will be negative; whereas for magnitudes in p below .50 the differences will be positive. Each one of the family of arched curves shown corresponds to a designated level of tetrachoric correlation (or equivalently biserial correlation in the instance of a normal correlation surface) between the responses to an item and the criterion variable.

A second family of curves in p , which resembles a sequence of parallel lines with negative slope, permits one to determine the magnitude of p from knowledge of values in p_E and r_t . Finally it should be noted that the proportion p' in each of the two extreme groups is .2743 (which is the proportion of area in the unit normal curve beyond a standard score of .60) instead of .27, since the tabulations in Pearson's "Volumes of a Normal Bivariate Surface" are in terms of tenths of a standard score.

Conclusions

From a study of the abac it is apparent that (1) the higher the degree of correlation (validity) the greater is the amount of systematic error; (2) the amount of increase in error is positively accelerated relative to equal increments in r_t ; (3) the amount of systematic error is highly dependent upon the level of item difficulty as is evidenced by the fact that the magnitude of the error is zero when p_E is .50, is at a maximum for p_E between .25 and .15 (.75 and .85) when $r_t < .65$ and for p_E between .40 and .25 (.60 and .75) when $r_t > .65$, and sharply drops for difficulty levels constituting extreme departures from .50.

Illustrative Example

To demonstrate the use of the abac a numerical problem may be presented: Given that $p_E = .29$ and that $r_t = .52$, find p_E and p and estimate p . Entering the horizontal axis at a point just to the right of .30, then rising vertically to a point about 2/5 of the way between the two curves corresponding to $r_t = .50$ and $r_t = .55$, and then following to the left a horizontal line (parallel to the base line), one finds on the vertical axis (at the left) that the amount of systematic error $p_E - p$ is given as about $+.022$. Since $p_E < .50$, the estimated amount of discrepancy $p_E - p$ is $+.022$. To determine the magnitude of p one can subtract .022 from .29 and come out with an estimate of about .268. An alternative solution would be presented by looking at the point $(p_E, r_t) = (.29, .52)$ and by then interpolating visually between the two curves (lines) $p = .2743$ and $p = .2420$. Since the point is roughly one-fourth to one-fifth of the distance

between the two parallel curves (lines), the estimate is given as $.2743 + .2$ ($.2420 - .2743$), or about .268.

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Other materials on sound school library practice may be obtained from Mrs. Grace Dunkley of the California School Library Association, 16703 South Clark Avenue, Bellflower, California.

"Fade Out" of Continuation Education Programs in the United States

GORDON WARNER

The term "part time" compulsory continuation school or class had uniform meaning throughout the United States in 1919-1920. However, thirty-five years later, the conception of the term "continuation education" is varied.

Compulsory continuation education consists of schools or classes for employed minors fourteen to eighteen years of age. While employed, these minors are required to attend the continuation school or class in California at least four hours each week. During periods of unemployment (in California) these minors are required to attend these schools or classes at least fifteen hours each week.

Many boys and girls between the ages of fourteen and eighteen leave the regular full time school to earn the dollars they deem so necessary to mark them as having come of age. A review of the many studies on drop-outs of our regular public schools seems to indicate that dropping out is the result of companions' caprices, whims and fancies, a dislike of school and some teachers, home life, and the desire to start working. The continuation education student is the first to admit that he is poorly prepared to meet the demands of society with his meager education, little knowledge of industry, and lack of vocational training.

Origin and Purpose

Thirty-seven years ago continuation education programs afforded their students an opportunity to continue or receive assistance in their general education, obtain vocational training, and become more intelligent citizens.

The schools aided in placement, prevented much drifting from one job to another, and assisted in advisement and guidance concerning vocational opportunities. Few juvenile misfits in the regular full time school were

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assigned to the new program at first. However, they soon learned its advantages and began to find the continuation school a haven from the regular school routine. It was not long before the continuation education program became a "dumping ground" for the regular school.

At the very beginning of part time compulsory education in the United States in 1919 individual states enacted laws that varied greatly. In a few states many conditions were stated specifically in the part time law. In others, the actual administration of part time schools was left to the State Boards of Vocational Education. In every state, either the State Board of Education or the State Board of Vocational Education was charged with the duty of formulating rules and regulations concerning the establishment of compulsory part time schools. Each state has made reference at some time to the number of minors required for establishment of a continuation education school or class program.

Trends

Continuation schools have not been established with uniformity in all of the states and territories, nor have the legal provisions for the establishment of continuation education programs been passed by all of the forty-eight states and territories. Table I indicates the wide variance and utter lack of uniformity among the states with respect to attendance regulations. The age group of the children required to attend has a considerable variation in each of the states. The enforcement and the exemption provisions are different for a variety of reasons. The evolution of the laws governing continuation school education in the separate states and territories has been haphazard at most. In most cases the actual establishment of continuation schools preceded the laws which later made them compulsory.

The early movements gave results which were approved by school administrators as can be seen from the following comments. Superintendent Stratton D. Brooks of the Boston Public Schools was authorized in May, 1909, "With (the) assistance of merchants and manufacturers in that city, to establish schools similar to the continuation schools of Europe," whereby persons compelled to leave the regular day school could receive instruction that would enable them to become more efficient in the stores and factories in which they were employed.

In New York City in 1911, a recommendation for a system of continuation schools was made in the following statement by Superintendent William H. Maxwell, of the New York City Public Schools:

I recommend a system of continuation schools from 7 a.m. to 9 a.m. and from 4 p.m. to 6 p.m. to be organized, the legislations be sought to require employers to give each employee under 19 years of age, 4 to 6 hours a week for 40 weeks each year and to constrain young people between these ages to attend such schools regularly. . . . An effort should be made to adapt the work of these schools to the individual capacities and needs of each pupil.

The World War I period gave the needed impetus to the continuation education movement throughout the United States. The great lack of industrial efficiency was apparent in so many cases that the need for an expanded educational program for out-of-school minors had been made obvious to many who had never considered the problem before. Even so, there was only a comparatively small group of employed minors who made an effort to avail themselves of the existent continuation school program.

The Continuation School Teachers Association of New York City published an account of the daytime continuation education program of the city in 1927. The publication gave the total enrollment of New York City continuation schools as 63,600 students in 1927. There were 537 teachers giving instruction to part-time continuation classes.

Although Professor Albert Shiels of Teachers College, Columbia University, saw the continuation schools as an attempt to meet the needs of young workers, E. W. Edwards thought that criticisms of the part time day continuation school law and attempts to amend this law had become an organized movement by 1927. This movement was designed to bring about the substitution of evening schools for the day continuation schools.

In 1930 over three hundred thousand students were enrolled in the 282 remaining continuation schools in the nation.¹ But a review of the *Digests of Annual Reports of State Boards for Vocational Education* for the years following this shows that the continuation education school enrollment was trending downward from its peak in 1930.

The opinion of continuation education leaders as of 1949 is found in the statements received by Smith-Jacobs from prominent authorities on the future of the continuation program:

Keller: The decline in interest in continuation education has certainly been due to the raising of the full time compulsory school age . . .

Evans: Continuation school education has served its purpose for the 14-16 year age group because practically all of that group is now required to attend school until sixteen.

Rasche: First, practically all our large cities are embarrassed by diminishing tax resources. . . . These schools (continuation) should be abandoned only when the general school system actually achieves in doing everything that should be done for youth through education as influenced by organized schools.

¹ Grayson N. Kefauver, Victor H. Noall, and C. E. Drake, *Part-Time Secondary Schools*, Monograph No. 3, Bulletin No. 17, Washington, D.C., U.S. Office of Education, Government Printing Office, 1932.

The Question

To obtain information about the status of continuation education in the forty-eight states and seven territories today, a brief questionnaire was formulated in March 1954 and sent to each State Superintendent of Education. All questionnaires sent out were returned, so that a complete survey of the status was possible. See Table I for the tally of the questions. The data were compared with the results of earlier surveys to determine trends.

Answers to the questionnaire regarding the operation of a continuation-education or part-time-education program for working minors disclosed that some states have ceased to offer a continuation program, while others have not as yet established either a class or school for their working minors. From the loose interpretation of the term "continuation education" or part time continuation, it can be concluded from the results of the questionnaire that there is a decline in the interest for such a program today.

California's Problem

The enthusiasm which swept California for part time education lasted just ten years from the enactment of the law in 1919. In 1930, legislation revised the part time law both in purpose and title. The program was now **compulsory**, and changed to **continuation education**. Thus, any student who had not completed regular full time high school requirements for graduation and who received a permit to work was required to attend a continuation school or class.

In addition to regularly employed students who obtained a work permit, students who were unemployed also were required to attend a continuation school or class not less than 3 hours per day, each day, until they obtained work. This section of the new law brought a wave of resentment from parents and youth.

From many studies which have been made it is apparent that the part time school population is a selected group that is quite diversified, and generally having intelligence quotients that overlap with pupils who remain in the regular school. However, generally speaking, the average mental age of the continuation school student has been found to be lower than the average of the equivalent group in the full time school. This wide range requires individual material to be constructed to fit the various levels. Among these students the majority have fallen far below the grade for their age, and the habit of failure is overwhelmingly strong. It is exceedingly difficult to rebuild confidence.

The instructor in a continuation education class is constantly faced with the problem of avoiding repetition. Students in continuation education face blocks which regular high school students do not meet. Compulsory attendance, work permits for each new job, termination cards, regulations,

TABLE I

Status of Continuation Education Programs in the United States
and Its Territories in 1954*

Place and Date Where First Established	Number of Students, 1954	Number of Teachers, 1954	Is Program Adequate?	New Program Needed?
ALABAMA—Birmingham, 1918-20	1,945	41	Good program, poor finance ^a	No
CALIFORNIA—Los Angeles, 1918	4,962	—	Yes & No	Yes
FLORIDA—Miami, 1948	8,345	383	Yes	No
GEORGIA—Atlanta, Porterdale, 1919	2,685	48	Yes	No
ILLINOIS—Chicago, 1919	—	—	— ^b	—
INDIANA—Wabash, 1917	563	29	Yes & No	Yes
IOWA—Mason City, 1918	2,799	—	Yes & No	No
MARYLAND—Baltimore, 1924, 1936	330	12	No	No
MASSACHUSETTS—1913	800	—	—	—
MICHIGAN—Detroit, 1919	100	—	No	Yes
MINNESOTA—1936	1,506	—	Yes	—
MISSOURI—Columbus City, 1936	1,700	92½	Yes	No
NEW YORK—Manhattan, Bronx, 1910	13,912	—	No ^c	No ^c
OKLAHOMA—Tulsa, 1935	773	34	Yes	Small areas
OREGON—Portland, 1925	958	—	Yes	
PENNSYLVANIA—Philadelphia, 1925	17,500	726	Yes ^d	No
SOUTH CAROLINA—Youngs Township, 1917	379	12	—	Yes
TEXAS—Laredo, 1854	—	—	—	—
VIRGINIA—Norfolk Navy Yard, 1923	831	39	Yes	e
WASHINGTON—Seattle, 1922	20	—	—	No
WISCONSIN—Racine, 1911	11,348	527	—	No
WYOMING—Casper, 1948	65	1	Yes	—
GUAM—1954	—	—	—	—

^aSet up for workers in trade and industry. ^bProgram operates only in Chicago.^cReorganization of curriculum needed. ^dNeeds expansion as there are 40,000 still not attending. ^eMore divisions are needed.

* Continuation Education programs are not in progress at the present time in the following states and territories:

Arizona	Kansas	Nebraska	North Dakota	West Virginia
Arkansas	Kentucky	Nevada	Ohio	Alaska
Colorado	Louisiana	New Hampshire	Rhode Island	Hawaii
Connecticut	Maine	New Jersey	South Dakota	Panama
Delaware	Mississippi	New Mexico	Utah	Puerto Rico
Idaho	Montana	North Carolina	Vermont	Samoa
				Virgin Islands

Results

It is felt by some administrators that there is a decreasing need for continuation education schools and classes with the decreasing employment opportunities for minors. The increased holding power of the regular full time school has also been a factor in lowering the enrollment of continuation schools.

Generally only a few employers will give the under-eighteen-year-old youth an opportunity to work because of the city, county, state, and federal regulations which must be followed during the youth's employment. A major deterring factor is the cost of the insurance which must be held by the employer.

There is a change in continuation schools in many states in the direction of becoming **adjustment schools** to handle the problem cases of the regular full time school. It is the intent of these adjustment schools to attempt to direct the student who has dropped from a regular school program back into the regular full time school program with a much better understanding of the requirements of society or drop the student from the school program.

There is need for increased state financial support for continuation education schools or classes. If the revenue is not forthcoming, it would be advantageous not only to the student, but the school districts as well, to consolidate continuation education with adjustment-schools and support the enlarged program.

There are wide variations among attempts to coordinate the special services offered by continuation education with other secondary school services. More knowledge of the community and its resources is required of the continuation education coordinator, who is most always the instructor of the continuation class, than is required in the elementary or secondary schools.

The method and content of instruction vary widely. There are some cities which conduct unit programs; others require regular standardized high school work; and others have a greatly modified general continuation education program. In some cities the continuation education classes are furnished with a permanent projector for visual aids, and an adequate library stocked with current magazines and other material. This is highly recommended because of the variation of continuation student interest.

Work permits today are merely an additional holding device affecting a very small percentage of young drop-outs from public, parochial, and private schools. Through various interpretations of the legal sections on compulsory continuation education throughout the nation, the continuation student is largely directed at the local level. A small number of the sixteen-to-eighteen-year-olds eligible for continuation education are actually enrolled in such classes. Those that are enrolled believe that they are caught in an unjust situation.

There is a very definite need for the simplification and clarification of the California compulsory continuation education law. At the present time it is being interpreted in different ways by different legal authorities. If there is to be a continuation of the California compulsory education program constructive action should be taken to correct its major defects. If there is to be a law to govern continuation education in the state, the law should be adhered to in every county and city of California, and not left up to local interpretation. The law should be so drawn up that its intent can be understood by administrators, instructors, the students, parents, and employers.

It is recommended that the compulsory continuation education law be amended in the matter of continuation school attendance so that such attendance as is now required be eliminated and in its place be substituted a program of guidance and follow-up of sixteen-year-olds who may be employed. The continuation schools were organized under conditions which no longer prevail, both in the working world and in education. It is questionable whether the four hours a week of compulsory attendance is achieving its purpose despite the well intentioned efforts of those who are responsible for its administration.

The excellent cooperative relationship between schools, parents and employers was generally overlooked by the student. Through the work permit form, all three had a hand in the youth's future. His place of employment was known; the hours of school attendance were recorded; and the parent gave approval. This combination afforded him the opportunity of obtaining experience and training for his future. This arrangement lasted until twenty-five years ago when, as a result of the depression, youth was forced to leave employment. The continuation education school lost its enrollment and gradually was absorbed by the trade and industrial schools.

The continuation education program where it exists is a social laboratory in which the vocational, mental, physical, moral, and social equipment of the young worker are analyzed. This is carried out with a view to the development of special abilities and the correction of deficiencies as they are revealed. Primarily, the continuation school means simply the continuing of the young worker's education as far as possible.

If a continuation program is to exist the community must join with the public school in establishing sound employment programs for workers under the age of eighteen. Interested organizations should pool their possible job openings and afford young workers the opportunity of participating in gainful employment.

This project should have attached to it a sound vocational guidance program. Such a program could effectively coordinate the employment of sixteen-to-eighteen-year-old youth. Such a program would not only guide youth into feasible vocational fields for future development, but could detect the maladjusted, and protect and assist both the employee and employer in a trying situation.

Book Reviews

A STUDY OF THE NEED FOR ADDITIONAL CENTERS OF PUBLIC HIGHER EDUCATION IN CALIFORNIA

Sacramento: California State Department of Education, 1957. 172 pages, paper.

This publication constitutes the report of the staff of the Liaison Committee of the State Board of Education and the Regents of the University of California. This Committee was established in 1945 as a means of coordinating the University and the state colleges. It consists of four members each from the Regents and the State Board of Education, including the President of the University and the Superintendent of Public Instruction.

The 1955 Legislature received many bills calling for the establishment of new state colleges. As a result, legislation was enacted directing that studies be made of the needs for higher educational institutions in the State, with particular reference to areas in which new state colleges have been proposed. The Liaison Committee employed a joint technical staff to survey the needs and prepare a report.

The staff and the Committee are to be congratulated upon the broad scope of their report. They have not confined their study to the areas where study was required by the legislature, nor have they restricted it to the University and state colleges. The need for junior colleges is given major consideration, along with the probable interactions of colleges, university, and junior colleges.

Major attention is given to the recommendation of criteria for the establishment of junior colleges, state colleges, and new campuses of the University of California. The report indicates that more of all three facilities are needed.

Fourteen new junior college districts are recommended. The report strongly implies that these should be created at once, and notes approvingly that elections have been called in connection with two of them. Two of the proposed districts would relieve the remaining state colleges that have junior-college functions from this responsibility. It is the opinion of the staff and the Committee that it is not possible satisfactorily to combine the functions of a state college with those of a junior college.

Nine new state colleges are recommended for serious consideration by 1970. State colleges in Alameda, San Bernardino or Riverside, Contra Costa, and Kern Counties are recommended for immediate consideration.

Five others are indicated as having enrollment potentialities sufficient to warrant their establishment by 1970. Four other possible locations for state colleges are given negative recommendations on the grounds that their enrollment potential is not great enough in the foreseeable future. The recommendations are based on the assumption that an enrollment of at least 2,000 full-time students is needed to make unit costs reasonable. Dormitory and transportation facilities, together with state scholarship aid, are recommended to take care of students from areas in which state colleges cannot be economically established.

Since the projected enrollments of Berkeley and UCLA are 35,200 and 39,900, respectively, by 1970, the report strongly recommends additional campuses for the University of California. Southeast Los Angeles County, Santa Clara County, and San Diego County are the three areas in which immediate expansion of facilities is recommended. The San Diego campus might be formed by an expansion of the present Scripps Institute of Oceanography into a full-fledged general university campus; but the other two locations would require entirely new establishments.

In addition to specific recommendations, the report contains much interesting material on the functions of the three types of institutions considered, the nature and quality of the programs they are now offering, and the problems they are facing in adjusting to expanding enrollments. The book concludes with a very comprehensive appendix that contains all the statistics and data on which the recommendations were based. Whether or not one agrees with the opinions expressed, one must recognize the report as being very sound from a research point of view.

CANADIAN EDUCATION TODAY, A Symposium

JOSEPH KATZ, Editor

Toronto: McGraw-Hill Book Company of Canada Limited, 1956. 243 pages. \$3.95.

Canadian education is a lot like education in the United States; but it is by no means the same. This book is not an attempt to explain either the similarities or the differences to those south of the border, but it will be interesting and very instructive to those United States educators who read it. They will find the usual chapters on education and social change, educational psychology, curriculum construction, teacher training, and so on; but they will also find chapters on the "new composite schools," the work of the universities, and the humanities, which approach things in a different way.

The greatest similarity between Canadian and United States education is the absence of a centralized federal system of schools. As the editor says

in the summary chapter, "Canada is possessed of educational systems which are vigorous in their pursuit of different ideals of education, are vital in their approach to the many different problems confronting schools and universities; and are as different from one another as are the provincial boundaries which separate them."

Differences, on the other hand, are to be found more in the degree of emphasis given to various goals of education and methods of procedure. The role of the school in the development of children is plainly thought to be less vital than is the case in the United States. In particular, there is a greater tendency to view education as preparation for life and to expect early differentiation based on the life goals of the student. However, the composite high school movement described in one chapter may reduce this tendency in the future.

EDUCATION AS A PROFESSION

MYRON LIEBERMAN

Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1956. 590 pages. \$8.00

This book is the first comprehensive survey of the professional status of education. The author appears to have done an excellent job of reporting on the present conditions in the occupation of education. It is his contention that the assumption that education is already a profession has prevented an objective analysis of the degree to which it actually meets the criteria of professionalism.

The first part of the volume is devoted to a description of the characteristics of a profession. Beginning with the fifth chapter various educational activities are studied in terms of this description. Areas considered include: teacher education and certification, educational associations and teachers unions, collective bargaining, ethics, and occupational status of teachers.

On the whole the author appears to have done an excellent job. His objective approach is refreshingly in contrast to the writings of some who smugly assume that the professional status of education is accepted and its pattern fixed. His chief weakness appears to result from his lack of awareness of some of the most recent advances in professionalism in certain areas of education, such as professional standards, salary and personnel procedures, development of educational policy. His treatment of state and local teacher organizations—both union and professional—is also weak.

This book is recommended to all who seriously aspire to creating a profession of education and to all others who recognize that the professional status of education profoundly affects their own position. It is to be hoped that its shortcomings will inspire others to follow the author's lead by producing some other books which will emphasize the advances made recently in California and other states.

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3. Studies that present novel, but tested, approaches to the solution of educational problems.

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